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Venus Express observation of the induced magnetosphere

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Abstract

Although there is no intrinsic magnetic field at Venus, the convected interplanetary magnetic field piles up to form a magnetic barrier in the dayside inner magnetosheath. In analogy to the Earth's magnetosphere, the magnetic barrier acts as an induced magnetosphere on the dayside and hence as the obstacle to the solar wind. In the nightside, the induced magnetotail forms as a result of the atmospheric mass loading and subsequent draping of passing magnetosheath flux tubes that sink into the wake. Recent studies suggest that the atmospheric loss at Venus is mainly through the induced magnetospheric boundary layers in the wake. Thus understanding the response of the induced magnetosphere to various solar and solar wind conditions is crucial not only in studying planetary environments, but also in reconstructing the evolution of planetary atmospheres. In this paper, we examine the latest Venus Express observation of the induced magnetosphere.